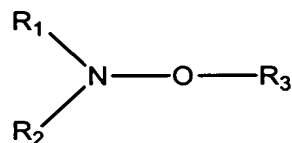


THE CLAIMS

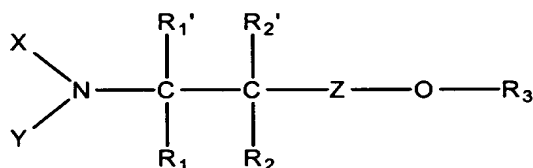
WHAT IS CLAIMED IS:

1. A substantially hydroxylamine-free composition comprising:
from about 1 wt% to about 30 wt% of a hydroxylamine derivative having the
formula



wherein R_1 , R_2 , and R_3 are independently a hydrogen atom, a hydroxyl group, a substituted C_1 - C_6 straight, branched, or cyclic hydrocarbon group, a substituted acyl group, a straight or branched alkoxy, amidyl, carboxyl, alkoxyalkyl, alkylamino, alkylsulfonyl, or sulfonic acid group, or a salt of such compounds, and wherein at least one of R_1 , R_2 , and R_3 is not a hydrogen atom;

from about 20 wt% to about 80 wt% of a two-carbon atom linkage
alkanolamine compound having the formula



wherein R_1 , R_1' , R_2 , R_2' , and R_3 are, independently in each case, hydrogen or a linear, branched, or cyclic hydrocarbon containing from 1 to 7 carbon atoms, wherein Z is a group having the formula $-(Q-CR_1R_1'-CR_2R_2')_m-$, such that m is a whole number from 0 to 3, R_1 , R_1' , R_2 , and R_2' are independently defined in each repeat unit, if $m > 1$, within the parameters set forth for these moieties above, and Q is independently defined in each repeat unit, if $m > 1$, each Q being independently either $-O-$ or $-NR_3-$, and wherein X and Y are, independently in each case, hydrogen, a C_1 - C_7 linear, branched, or cyclic hydrocarbon, or a group having the formula $-CR_1R_1'-CR_2R_2'-Z-F$, with F being either $-O-R_3$ or $-NR_3R_4$, where R_4 is defined similarly to R_1 , R_1' , R_2 , R_2' , and R_3 above, and with Z , R_1 , R_1' , R_2 , R_2' , and R_3 defined as above, or wherein X and Y are linked together form a nitrogen-containing heterocyclic C_4 - C_7 ring; and

from about 0.1 wt% to about 15 wt% of a corrosion inhibitor having single or multiple functionalities of one or more of the following: hydroxyl group, carboxylic acid, thiol group, amino group, alkoxy group, amidyl group, alkoxyalkyl group, alkylamino group, alkylsulfonyl group, sulfonic acid group, or a salt thereof,

26 wherein the composition is capable of removing residue from a metal or
27 metal alloy substrate or a metal or metal alloy substrate layer, while maintaining an
28 acceptably low etch rate with respect to the metal or metal alloy substrate or substrate layer.

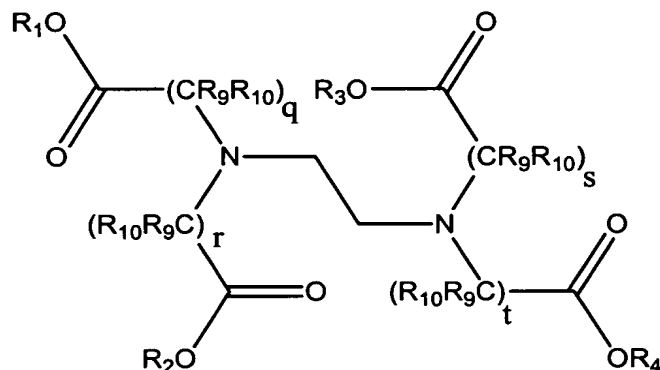
1 2. The substantially hydroxylamine-free composition of claim 1, further
2 comprising water in an amount from about 5 wt% to about 40 wt%.

1 3. The substantially hydroxylamine-free composition of claim 1,
2 wherein the composition is substantially free from water.

1 4. The substantially hydroxylamine-free composition of claim 1, further
2 comprising a polar organic solvent in an amount from about 5 wt% to about 15 wt%.

1 5. The substantially hydroxylamine-free composition of claim 1,
2 wherein the composition is substantially free from polar organic solvents.

1 6. The substantially hydroxylamine-free composition of claim 1,
2 wherein the corrosion inhibitor comprises gallic acid, catechol, or an ethylenediamine
3 tetracarboxylic acid compound having the formula



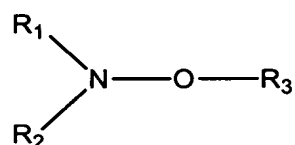
4 wherein R₁, R₂, R₃ and R₄ can be either H, or NR₅R₆R₇R₈, where R₅, R₆, R₇,
5 and R₈ are each independently hydrogen or a linear or branched C₁-C₆ hydrocarbon, or
6 where two or more of R₅, R₆, R₇, and R₈ together form a heterocyclic C₄-C₇ ring, wherein R₉
7 and R₁₀ may be independently defined in each repeat unit and each of which are
8 independently hydrogen or a linear or branched C₁-C₆ hydrocarbon, and wherein each of q,
9 r, s, and t is a whole number from 0 to 4.

1 7. The substantially hydroxylamine-free composition of claim 1,
2 wherein the two-carbon atom linkage alkanolamine compound has a boiling point of at least
3 about 185°C and a flash point of at least about 95°C.

1 8. The substantially hydroxylamine-free composition of claim 1,
2 wherein more than one two-carbon atom linkage alkanolamine compound is present in the
3 composition.

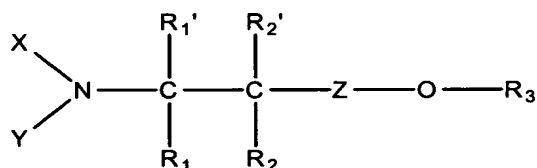
1 9. The substantially hydroxylamine-free composition of claim 1,
2 wherein the hydroxylamine derivative comprises N,N-diethylhydroxylamine.

1 10. A substantially polar organic solvent-free composition comprising:
2 from about 1 wt% to about 30 wt% of a hydroxylamine derivative having the
3 formula



4 wherein R_1 , R_2 , and R_3 are independently a hydrogen atom, a hydroxyl group, a substituted
5 C_1 - C_6 straight, branched, or cyclic hydrocarbon group, a substituted acyl group, a straight or
6 branched alkoxy, amidyl, carboxyl, alkoxyalkyl, alkylamino, alkylsulfonyl, or sulfonic acid
7 group, or a salt of such compounds, and wherein at least one of R_1 , R_2 , and R_3 is not a
8 hydrogen atom;

9 from about 20 wt% to about 80 wt% of a two-carbon atom linkage
10 alkanolamine compound having the formula



11 wherein R_1 , R_1' , R_2 , R_2' , and R_3 are, independently in each case, hydrogen or a linear,
12 branched, or cyclic hydrocarbon containing from 1 to 7 carbon atoms, wherein Z is a group
13 having the formula $-(Q-CR_1R_1'-CR_2R_2')_m-$, such that m is a whole number from 0 to 3, R_1 ,
14 R_1' , R_2 , and R_2' are independently defined in each repeat unit, if $m > 1$, within the parameters
15 set forth for these moieties above, and Q is independently defined in each repeat unit, if
16 $m > 1$, each Q being independently either -O- or -NR₃-, and wherein X and Y are,
17 independently in each case, hydrogen, a C_1 - C_7 linear, branched, or cyclic hydrocarbon, or a

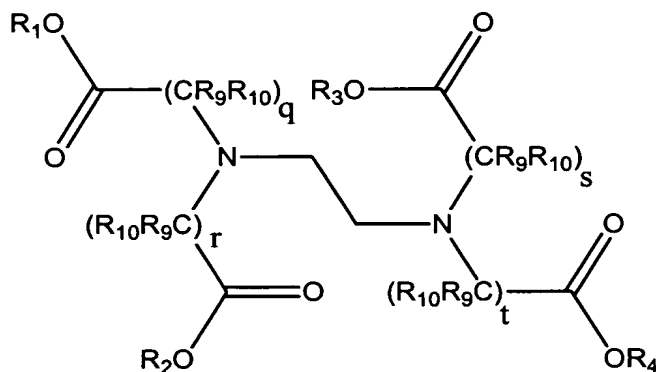
group having the formula $-CR_1R_1'-CR_2R_2'-Z-F$, with F being either $-OR_3$ or $-NR_3R_4$, where R_4 is defined similarly to R_1, R_1', R_2, R_2' , and R_3 above, and with Z, R_1, R_1', R_2, R_2' , and R_3 defined as above, or wherein X and Y are linked together form a nitrogen-containing heterocyclic C_4-C_7 ring; and

from about 0.1 wt% to about 15 wt% of a corrosion inhibitor having single or multiple functionalities of one or more of the following: hydroxyl group, carboxylic acid, thiol group, amino group, alkoxy group, amidyl group, alkoxyalkyl group, alkylamino group, alkylsulfonyl group, sulfonic acid group, or a salt thereof,

wherein the composition is capable of removing residue from a metal or metal alloy substrate or a metal or metal alloy substrate layer, while maintaining an acceptably low etch rate with respect to the metal or metal alloy substrate or substrate layer.

11. The substantially polar organic solvent-free composition of claim 10, further comprising water in an amount from about 5 wt% to about 40 wt%.

12. The substantially polar organic solvent-free composition of claim 10, wherein the corrosion inhibitor comprises gallic acid, catechol, or an ethylenediamine tetracarboxylic acid compound having the formula



wherein R_1, R_2, R_3 and R_4 can be either H, or $NR_5R_6R_7R_8$, where R_5, R_6, R_7 , and R_8 are each independently hydrogen or a linear or branched C_1-C_6 hydrocarbon, or where two or more of R_5, R_6, R_7 , and R_8 together form a heterocyclic C_4-C_7 ring, wherein R_9 and R_{10} may be independently defined in each repeat unit and each of which are independently hydrogen or a linear or branched C_1-C_6 hydrocarbon, and wherein each of q, r, s, and t is a whole number from 0 to 4.

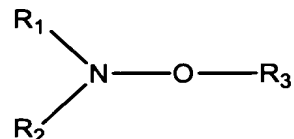
13. The substantially polar organic solvent-free composition of claim 10, wherein the two-carbon atom linkage alkanolamine compound has a boiling point of at least about 185°C and a flash point of at least about 95°C.

14. The substantially polar organic solvent-free composition of claim 13, wherein the two-carbon atom linkage alkanolamine compound comprises 2-(2-aminoethylamino)-ethanol, 2-(2-aminoethoxy)-ethanol, or both.

15. The substantially polar organic solvent-free composition of claim 10, wherein the hydroxylamine derivative comprises N,N-diethylhydroxylamine.

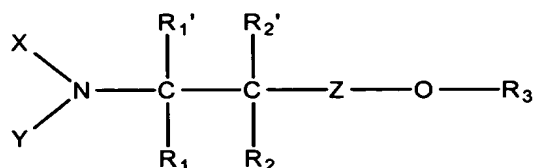
16. The substantially polar organic solvent-free composition of claim 10, further comprising hydroxylamine, wherein the ratio of hydroxylamine derivative to hydroxylamine is from about 20:1 to about 1:20, by weight.

17. A substantially polar organic solvent-free composition comprising: from about 1 wt% to about 30 wt% of a hydroxylamine derivative having the formula



wherein R_1 , R_2 , and R_3 are independently a hydrogen atom, a hydroxyl group, a substituted C_1 - C_6 straight, branched, or cyclic hydrocarbon group, a substituted acyl group, a straight or branched alkoxy, amidyl, carboxyl, alkoxyalkyl, alkylamino, alkylsulfonyl, or sulfonic acid group, or a salt of such compounds, and wherein at least one of R_1 , R_2 , and R_3 is not a hydrogen atom;

from about 20 wt% to about 80 wt% of a two-carbon atom linkage alkanolamine compound having the formula



wherein R_1 , R_1' , R_2 , R_2' , and R_3 are, independently in each case, hydrogen or a linear, branched, or cyclic hydrocarbon containing from 1 to 7 carbon atoms, wherein Z is a group having the formula $-(Q-CR_1R_1'-CR_2R_2')_m-$, such that m is a whole number from 0 to 3, R_1 ,

R₁', R₂, and R₂' are independently defined in each repeat unit, if m>1, within the parameters set forth for these moieties above, and Q is independently defined in each repeat unit, if m>1, each Q being independently either -O- or -NR₃-, and wherein X and Y are, independently in each case, hydrogen, a C₁-C₇ linear, branched, or cyclic hydrocarbon, or a group having the formula -CR₁ R₁'-CR₂ R₂'-Z-F, with F being either -O-R₃ or -NR₃R₄, where R₄ is defined similarly to R₁, R₁', R₂, R₂', and R₃ above, and with Z, R₁, R₁', R₂, R₂', and R₃ defined as above, or wherein X and Y are linked together form a nitrogen-containing heterocyclic C₄-C₇ ring; and

from about 5 wt% to about 45 wt% water,

wherein the composition is capable of removing residue from a metal or metal alloy substrate or a metal or metal alloy substrate layer, while maintaining an acceptably low etch rate with respect to the metal or metal alloy substrate or substrate layer.

18. The substantially polar organic solvent-free composition of claim 17, wherein the composition is substantially free from corrosion inhibitors.

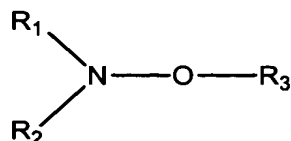
19. The substantially polar organic solvent-free composition of claim 17, wherein the two-carbon atom linkage alkanolamine compound has a boiling point of at least about 185°C and a flash point of at least about 95°C.

20. The substantially polar organic solvent-free composition of claim 19, wherein the two-carbon atom linkage alkanolamine compound comprises 2-(2-aminoethylamino)-ethanol, 2-(2-aminoethoxy)-ethanol, or both.

21. The substantially polar organic solvent-free composition of claim 17, wherein the hydroxylamine derivative comprises N,N-diethylhydroxylamine.

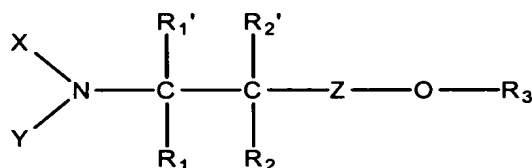
22. The substantially polar organic solvent-free composition of claim 17, further comprising hydroxylamine, wherein the ratio of hydroxylamine derivative to hydroxylamine is from about 20:1 to about 1:20, by weight.

23. A substantially hydroxylamine-free composition comprising:
from about 1 wt% to about 30 wt% of a hydroxylamine derivative having the
formula



wherein R_1 , R_2 , and R_3 are independently a hydrogen atom, a hydroxyl group, a substituted C_1 - C_6 straight, branched, or cyclic hydrocarbon group, a substituted acyl group, a straight or branched alkoxy, amidyl, carboxyl, alkoxyalkyl, alkylamino, alkylsulfonyl, or sulfonic acid group, or a salt of such compounds, and wherein at least one of R_1 , R_2 , and R_3 is not a hydrogen atom;

from about 20 wt% to about 80 wt% of a two-carbon atom linkage
alkanolamine compound having the formula



wherein R_1 , R_1' , R_2 , R_2' , and R_3 are, independently in each case, hydrogen or a linear, branched, or cyclic hydrocarbon containing from 1 to 7 carbon atoms, wherein Z is a group having the formula $-(Q-CR_1R_1'-CR_2R_2')_m-$, such that m is a whole number from 0 to 3, R_1 , R_1' , R_2 , and R_2' are independently defined in each repeat unit, if $m > 1$, within the parameters set forth for these moieties above, and Q is independently defined in each repeat unit, if $m > 1$, each Q being independently either -O- or - NR_3 -, and wherein X and Y are, independently in each case, hydrogen, a C_1 - C_7 linear, branched, or cyclic hydrocarbon, or a group having the formula $-CR_1R_1'-CR_2R_2'-Z-F$, with F being either -O- R_3 or - NR_3R_4 , where R_4 is defined similarly to R_1 , R_1' , R_2 , R_2' , and R_3 above, and with Z, R_1 , R_1' , R_2 , R_2' , and R_3 defined as above, or wherein X and Y are linked together form a nitrogen-containing heterocyclic C_4 - C_7 ring; and

from about 5 wt% to about 45 wt% water,
wherein the composition is capable of removing residue from a metal or metal alloy substrate or a metal or metal alloy substrate layer, while maintaining an acceptably low etch rate with respect to the metal or metal alloy substrate or substrate layer.

24. The substantially hydroxylamine-free composition of claim 23,
wherein the composition is substantially free from corrosion inhibitors.

1 25. The substantially hydroxylamine-free composition of claim 23,
2 wherein the two-carbon atom linkage alkanolamine compound has a boiling point of at least
3 about 185°C and a flash point of at least about 95°C.

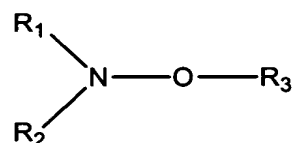
1 26. The substantially hydroxylamine-free composition of claim 25,
2 wherein the two-carbon atom linkage alkanolamine compound comprises 2-(2-
3 aminoethylamino)-ethanol, 2-(2-aminoethoxy)-ethanol, or both.

1 27. The substantially hydroxylamine-free composition of claim 23,
2 wherein the hydroxylamine derivative comprises N,N-diethylhydroxylamine.

1 28. The substantially hydroxylamine-free composition of claim 23,
2 further comprising a polar organic solvent in an amount from about 5 wt% to about 15 wt%.

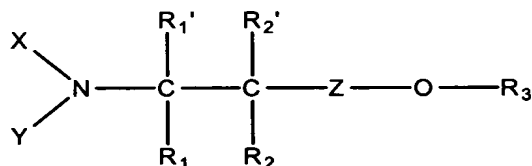
1 29. The substantially hydroxylamine-free composition of claim 23,
2 wherein the composition is substantially free from polar organic solvents.

1 30. A substantially water-free composition comprising:
2 from about 5 wt% to about 30 wt% of a hydroxylamine derivative having the
3 formula



4 wherein R_1 , R_2 , and R_3 are independently a hydrogen atom, a hydroxyl group, a substituted
5 C_1 - C_6 straight, branched, or cyclic hydrocarbon group, a substituted acyl group, a straight or
6 branched alkoxy, amidyl, carboxyl, alkoxyalkyl, alkylamino, alkylsulfonyl, or sulfonic acid
7 group, or a salt of such compounds, and wherein at least one of R_1 , R_2 , and R_3 is not a
8 hydrogen atom; and

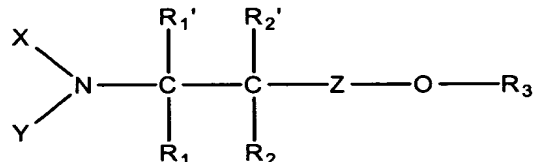
9 from about 20 wt% to about 80 wt% of a two-carbon atom linkage
10 alkanolamine compound having the formula



wherein R_1 , R_1' , R_2 , R_2' , and R_3 are, independently in each case, hydrogen or a linear, branched, or cyclic hydrocarbon containing from 1 to 7 carbon atoms, wherein Z is a group having the formula $-(Q-CR_1R_1'-CR_2R_2')_m-$, such that m is a whole number from 0 to 3, R_1 , R_1' , R_2 , and R_2' are independently defined in each repeat unit, if $m>1$, within the parameters set forth for these moieties above, and Q is independently defined in each repeat unit, if $m>1$, each Q being independently either -O- or -NR₃-, and wherein X and Y are, independently in each case, hydrogen, a C₁-C₇ linear, branched, or cyclic hydrocarbon, or a group having the formula -CR₁R_{1'}-CR₂R_{2'}-Z-F, with F being either -O-R₃ or -NR₃R₄, where R₄ is defined similarly to R_1 , R_1' , R_2 , R_2' , and R_3 above, and with Z, R_1 , R_1' , R_2 , R_2' , and R_3 defined as above, or wherein X and Y are linked together form a nitrogen-containing heterocyclic C₄-C₇ ring,

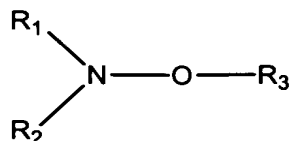
wherein the composition is capable of removing residue from a metal or metal alloy substrate or a metal or metal alloy substrate layer, while maintaining an acceptably low etch rate with respect to the metal or metal alloy substrate or substrate layer.

31. A composition consisting essentially of:
at least about 40% by weight of a two-carbon atom linkage alkanolamine compound having the formula



wherein R_1 , R_1' , R_2 , R_2' , and R_3 are, independently in each case, hydrogen or a linear, branched, or cyclic hydrocarbon containing from 1 to 7 carbon atoms, wherein Z is a group having the formula $-(Q-CR_1R_1'-CR_2R_2')_m-$, such that m is a whole number from 0 to 3, R_1 , R_1' , R_2 , and R_2' are independently defined in each repeat unit, if $m>1$, within the parameters set forth for these moieties above, and Q is independently defined in each repeat unit, if $m>1$, each Q being independently either -O- or -NR₃-, and wherein X and Y are, independently in each case, hydrogen, a C₁-C₇ linear, branched, or cyclic hydrocarbon, or a group having the formula -CR₁R_{1'}-CR₂R_{2'}-Z-F, with F being either -O-R₃ or -NR₃R₄, where R₄ is defined similarly to R_1 , R_1' , R_2 , R_2' , and R_3 above, and with Z, R_1 , R_1' , R_2 , R_2' , and R_3 defined as above, or wherein X and Y are linked together form a nitrogen-containing heterocyclic C₄-C₇ ring;

from about 1% to about 30% by weight of a hydroxylamine derivative having the formula



wherein R_1 , R_2 , and R_3 are independently a hydrogen atom, a hydroxyl group, a substituted C_1 - C_6 straight, branched, or cyclic hydrocarbon group, a substituted acyl group, a straight or branched alkoxy, amidyl, carboxyl, alkoxyalkyl, alkylamino, alkylsulfonyl, or sulfonic acid group, or a salt of such compounds, and wherein at least one of R_1 , R_2 , and R_3 is not a hydrogen atom;

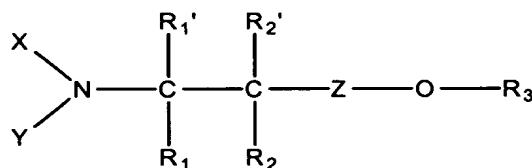
from about 0.1% to about 15% by weight of a corrosion inhibitor having single or multiple functionalities of one or more of the following: hydroxyl group, carboxylic acid, thiol group, amino group, alkoxy group, amidyl group, alkoxyalkyl group, alkylamino group, alkylsulfonyl group, sulfonic acid group, or a salt thereof; and

from 0% to about 50% by weight of water,

wherein the composition is capable of removing residue from a titanium or titanium alloy substrate or a titanium or titanium alloy substrate layer, while maintaining an acceptably low etch rate with respect to the titanium or titanium alloy substrate or substrate layer.

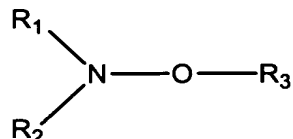
32. A composition consisting essentially of:

from about 20% to about 80% by weight of a two-carbon atom linkage alkanolamine compound having the formula



wherein R_1 , R_1' , R_2 , R_2' , and R_3 are, independently in each case, hydrogen or a linear, branched, or cyclic hydrocarbon containing from 1 to 7 carbon atoms, wherein Z is a group having the formula $-(Q-CR_1R_1'-CR_2R_2')_m-$, such that m is a whole number from 0 to 3, R_1 , R_1' , R_2 , and R_2' are independently defined in each repeat unit, if $m > 1$, within the parameters set forth for these moieties above, and Q is independently defined in each repeat unit, if $m > 1$, each Q being independently either $-O-$ or $-NR_3-$, and wherein X and Y are, independently in each case, hydrogen, a C_1 - C_7 linear, branched, or cyclic hydrocarbon, or a group having the formula $-CR_1R_1'-CR_2R_2'-Z-F$, with F being either $-OR_3$ or $-NR_3R_4$, where R_4 is defined similarly to R_1 , R_1' , R_2 , R_2' , and R_3 above, and with Z , R_1 , R_1' , R_2 , R_2' , and R_3

defined as above, or wherein X and Y are linked together form a nitrogen-containing heterocyclic C₄-C₇ ring;
 from about 1% to about 19% by weight of a hydroxylamine derivative having the formula



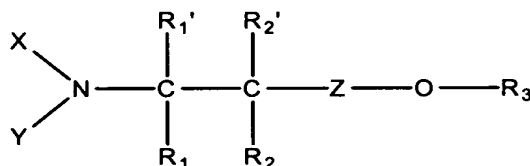
wherein R₁, R₂, and R₃ are independently a hydrogen atom, a hydroxyl group, a substituted C₁-C₆ straight, branched, or cyclic hydrocarbon group, a substituted acyl group, a straight or branched alkoxy, amidyl, carboxyl, alkoxyalkyl, alkylamino, alkylsulfonyl, or sulfonic acid group, or a salt of such compounds, and wherein at least one of R₁, R₂, and R₃ is not a hydrogen atom;

from about 0.1% to about 15% by weight of a corrosion inhibitor having single or multiple functionalities of one or more of the following: hydroxyl group, carboxylic acid, thiol group, amino group, alkoxy group, amidyl group, alkoxyalkyl group, alkylamino group, alkylsulfonyl group, sulfonic acid group, or a salt thereof; and

from about 0% to about 39% by weight of water,

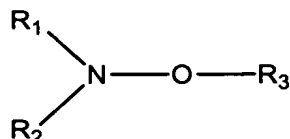
wherein the composition is capable of removing residue from a titanium or titanium alloy substrate or a titanium or titanium alloy substrate layer, while maintaining an acceptably low etch rate with respect to the titanium or titanium alloy substrate or substrate layer.

33. A composition consisting essentially of:
 not more than 51.0% by weight of a two-carbon atom linkage alkanolamine compound having the formula



wherein R₁, R₁', R₂, R₂', and R₃ are, independently in each case, hydrogen or a linear, branched, or cyclic hydrocarbon containing from 1 to 7 carbon atoms, wherein Z is a group having the formula $(-\text{Q}-\text{CR}_1\text{R}_1'-\text{CR}_2\text{R}_2'-)_m$, such that m is a whole number from 0 to 3, R₁, R₁', R₂, and R₂' are independently defined in each repeat unit, if m>1, within the parameters set forth for these moieties above, and Q is independently defined in each repeat unit, if m>1, each Q being independently either -O- or -NR₃-, and wherein X and Y are,

independently in each case, hydrogen, a C₁-C₇ linear, branched, or cyclic hydrocarbon, or a group having the formula -CR₁R₁'-CR₂R₂'-Z-F, with F being either -O-R₃ or -NR₃R₄, where R₄ is defined similarly to R₁, R₁', R₂, R₂', and R₃ above, and with Z, R₁, R₁', R₂, R₂', and R₃ defined as above, or wherein X and Y are linked together form a nitrogen-containing heterocyclic C₄-C₇ ring;
 from about 1% to about 30% by weight of a hydroxylamine derivative having the formula



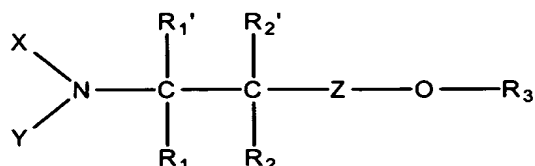
wherein R₁, R₂, and R₃ are independently a hydrogen atom, a hydroxyl group, a substituted C₁-C₆ straight, branched, or cyclic hydrocarbon group, a substituted acyl group, a straight or branched alkoxy, amidyl, carboxyl, alkoxyalkyl, alkylamino, alkylsulfonyl, or sulfonic acid group, or a salt of such compounds, and wherein at least one of R₁, R₂, and R₃ is not a hydrogen atom;

from about 0.1% to about 15% by weight of a corrosion inhibitor having single or multiple functionalities of one or more of the following: hydroxyl group, carboxylic acid, thiol group, amino group, alkoxy group, amidyl group, alkoxyalkyl group, alkylamino group, alkylsulfonyl group, sulfonic acid group, or a salt thereof; and

from about 0% to about 50% by weight of water,

wherein the composition is capable of removing residue from a copper or copper alloy substrate or a copper or copper alloy substrate layer, while maintaining an acceptably low etch rate with respect to the copper or copper alloy substrate or substrate layer.

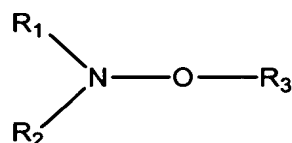
34. A composition consisting essentially of:
 from about 20% to about 80% by weight of a two-carbon atom linkage alkanolamine compound having the formula



wherein R₁, R₁', R₂, R₂', and R₃ are, independently in each case, hydrogen or a linear, branched, or cyclic hydrocarbon containing from 1 to 7 carbon atoms, wherein Z is a group having the formula -(Q-CR₁R₁'-CR₂R₂'-)_m-, such that m is a whole number from 0 to 3, R₁,

R_1' , R_2 , and R_2' are independently defined in each repeat unit, if $m > 1$, within the parameters set forth for these moieties above, and Q is independently defined in each repeat unit, if $m > 1$, each Q being independently either $-O-$ or $-NR_3-$, and wherein X and Y are, independently in each case, hydrogen, a C_1 - C_7 linear, branched, or cyclic hydrocarbon, or a group having the formula $-CR_1 R_1'-CR_2 R_2'-Z-F$, with F being either $-O-R_3$ or $-NR_3R_4$, where R_4 is defined similarly to R_1 , R_1' , R_2 , R_2' , and R_3 above, and with Z , R_1 , R_1' , R_2 , R_2' , and R_3 defined as above, or wherein X and Y are linked together form a nitrogen-containing heterocyclic C_4 - C_7 ring;

from about 1% to about 30% by weight of a hydroxylamine derivative having the formula



wherein R_1 , R_2 , and R_3 are independently a hydrogen atom, a hydroxyl group, a substituted C_1 - C_6 straight, branched, or cyclic hydrocarbon group, a substituted acyl group, a straight or branched alkoxy, amidyl, carboxyl, alkoxyalkyl, alkylamino, alkylsulfonyl, or sulfonic acid group, or a salt of such compounds, and wherein at least one of R_1 , R_2 , and R_3 is not a hydrogen atom;

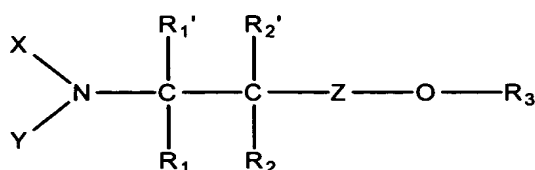
from about 6% to about 15% by weight of a corrosion inhibitor having single or multiple functionalities of one or more of the following: hydroxyl group, carboxylic acid, thiol group, amino group, alkoxy group, amidyl group, alkoxyalkyl group, alkylamino group, alkylsulfonyl group, sulfonic acid group, or a salt thereof; and

from about 0% to about 50% by weight of water,

wherein the composition is capable of removing residue from a copper or copper alloy substrate or a copper or copper alloy substrate layer, while maintaining an acceptably low etch rate with respect to the copper or copper alloy substrate or substrate layer.

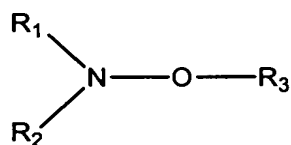
35. A composition consisting essentially of:

from about 20% to about 80% by weight of a two-carbon atom linkage alkanolamine compound having the formula



wherein R_1 , R_1' , R_2 , R_2' , and R_3 are, independently in each case, hydrogen or a linear, branched, or cyclic hydrocarbon containing from 1 to 7 carbon atoms, wherein Z is a group having the formula $-(Q-CR_1R_1'-CR_2R_2')_m-$, such that m is a whole number from 0 to 3, R_1 , R_1' , R_2 , and R_2' are independently defined in each repeat unit, if $m > 1$, within the parameters set forth for these moieties above, and Q is independently defined in each repeat unit, if $m > 1$, each Q being independently either -O- or -NR₃-, and wherein X and Y are, independently in each case, hydrogen, a C₁-C₇ linear, branched, or cyclic hydrocarbon, or a group having the formula -CR₁R_{1'}-CR₂R_{2'}-Z-F, with F being either -O-R₃ or -NR₃R₄, where R₄ is defined similarly to R_1 , R_1' , R_2 , R_2' , and R_3 above, and with Z, R_1 , R_1' , R_2 , R_2' , and R_3 defined as above, or wherein X and Y are linked together form a nitrogen-containing heterocyclic C₄-C₇ ring;

from about 1% to about 15% by weight of a hydroxylamine derivative having the formula



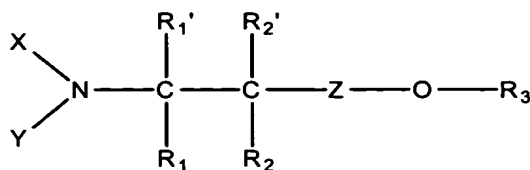
wherein R_1 , R_2 , and R_3 are independently a hydrogen atom, a hydroxyl group, a substituted C₁-C₆ straight, branched, or cyclic hydrocarbon group, a substituted acyl group, a straight or branched alkoxy, amidyl, carboxyl, alkoxyalkyl, alkylamino, alkylsulfonyl, or sulfonic acid group, or a salt of such compounds, and wherein at least one of R_1 , R_2 , and R_3 is not a hydrogen atom;

less than 5% by weight of a corrosion inhibitor having single or multiple functionalities of one or more of the following: hydroxyl group, carboxylic acid, thiol group, amino group, alkoxy group, amidyl group, alkoxyalkyl group, alkylamino group, alkylsulfonyl group, sulfonic acid group, or a salt thereof; and

from about 0% to about 31% by weight of water,

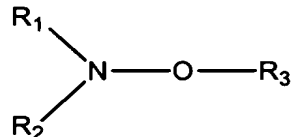
wherein the composition is capable of removing residue from a copper or copper alloy substrate or a copper or copper alloy substrate layer, while maintaining an acceptably low etch rate with respect to the copper or copper alloy substrate or substrate layer.

36. A composition consisting essentially of:
from about 20% to about 80% by weight of a two-carbon atom linkage alkanolamine compound having the formula



wherein R_1 , R_1' , R_2 , R_2' , and R_3 are, independently in each case, hydrogen or a linear, branched, or cyclic hydrocarbon containing from 1 to 7 carbon atoms, wherein Z is a group having the formula $-(\text{Q}-\text{CR}_1\text{R}_1'-\text{CR}_2\text{R}_2')_m-$, such that m is a whole number from 0 to 3, R_1 , R_1' , R_2 , and R_2' are independently defined in each repeat unit, if $m > 1$, within the parameters set forth for these moieties above, and Q is independently defined in each repeat unit, if $m > 1$, each Q being independently either -O- or - NR_3 -, and wherein X and Y are, independently in each case, hydrogen, a C_1 - C_7 linear, branched, or cyclic hydrocarbon, or a group having the formula $-\text{CR}_1\text{R}_1'-\text{CR}_2\text{R}_2'-\text{Z}-\text{F}$, with F being either - $\text{O}-\text{R}_3$ or - NR_3R_4 , where R_4 is defined similarly to R_1 , R_1' , R_2 , R_2' , and R_3 above, and with Z, R_1 , R_1' , R_2 , R_2' , and R_3 defined as above, or wherein X and Y are linked together form a nitrogen-containing heterocyclic C_4 - C_7 ring;

greater than about 15% by weight of a hydroxylamine derivative having the formula

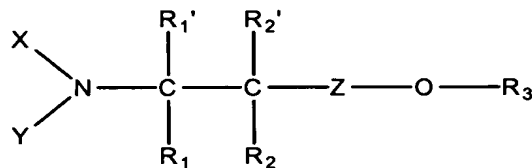


wherein R_1 , R_2 , and R_3 are independently a hydrogen atom, a hydroxyl group, a substituted C_1 - C_6 straight, branched, or cyclic hydrocarbon group, a substituted acyl group, a straight or branched alkoxy, amidyl, carboxyl, alkoxyalkyl, alkylamino, alkylsulfonyl, or sulfonic acid group, or a salt of such compounds, and wherein at least one of R_1 , R_2 , and R_3 is not a hydrogen atom;

from about 0.1% to about 15% by weight of a corrosion inhibitor having single or multiple functionalities of one or more of the following: hydroxyl group, carboxylic acid, thiol group, amino group, alkoxy group, amidyl group, alkoxyalkyl group, alkylamino group, alkylsulfonyl group, sulfonic acid group, or a salt thereof; and

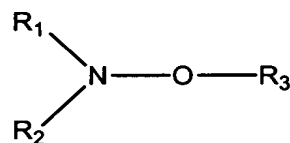
greater than 25% by weight of water, wherein the composition is capable of removing residue from a copper or copper alloy substrate or a copper or copper alloy substrate layer, while maintaining an acceptably low etch rate with respect to the copper or copper alloy substrate or substrate layer.

37. A composition consisting essentially of:
 not less than 50.0% by weight of a two-carbon atom linkage alkanolamine
 compound having the formula



wherein R_1 , R_1' , R_2 , R_2' , and R_3 are, independently in each case, hydrogen or a linear, branched, or cyclic hydrocarbon containing from 1 to 7 carbon atoms, wherein Z is a group having the formula $(-\text{Q}-\text{CR}_1\text{R}_1'-\text{CR}_2\text{R}_2'-)_m$, such that m is a whole number from 0 to 3, R_1 , R_1' , R_2 , and R_2' are independently defined in each repeat unit, if $m > 1$, within the parameters set forth for these moieties above, and Q is independently defined in each repeat unit, if $m > 1$, each Q being independently either -O- or -NR₃-, and wherein X and Y are, independently in each case, hydrogen, a C₁-C₇ linear, branched, or cyclic hydrocarbon, or a group having the formula -CR₁R_{1'}-CR₂R_{2'}-Z-F, with F being either -O-R₃ or -NR₃R₄, where R₄ is defined similarly to R_1 , R_1' , R_2 , R_2' , and R_3 above, and with Z, R_1 , R_1' , R_2 , R_2' , and R_3 defined as above, or wherein X and Y are linked together form a nitrogen-containing heterocyclic C₄-C₇ ring;

greater than about 11% by weight of a hydroxylamine derivative having the formula



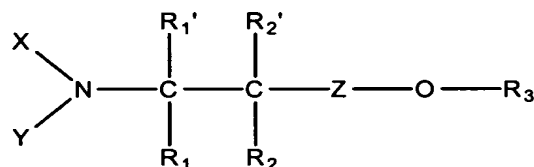
wherein R_1 , R_2 , and R_3 are independently a hydrogen atom, a hydroxyl group, a substituted C₁-C₆ straight, branched, or cyclic hydrocarbon group, a substituted acyl group, a straight or branched alkoxy, amidyl, carboxyl, alkoxyalkyl, alkylamino, alkylsulfonyl, or sulfonic acid group, or a salt of such compounds, and wherein at least one of R_1 , R_2 , and R_3 is not a hydrogen atom;

from about 0.1% to about 15% by weight of a corrosion inhibitor having single or multiple functionalities of one or more of the following: hydroxyl group, carboxylic acid, thiol group, amino group, alkoxy group, amidyl group, alkoxyalkyl group, alkylamino group, alkylsulfonyl group, sulfonic acid group, or a salt thereof; and

from about 0% to about 50% by weight of water,

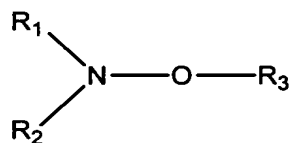
wherein the composition is capable of removing residue from an aluminum or aluminum alloy substrate or a copper or copper alloy substrate layer, while maintaining an acceptably low etch rate with respect to the aluminum or aluminum alloy substrate or substrate layer.

38. A composition consisting essentially of:
from about 20% to about 80% by weight of a two-carbon atom linkage alkanolamine compound having the formula



wherein R_1 , R_1' , R_2 , R_2' , and R_3 are, independently in each case, hydrogen or a linear, branched, or cyclic hydrocarbon containing from 1 to 7 carbon atoms, wherein Z is a group having the formula $(-\text{Q}-\text{CR}_1\text{R}_1'-\text{CR}_2\text{R}_2'-)_m$, such that m is a whole number from 0 to 3, R_1 , R_1' , R_2 , and R_2' are independently defined in each repeat unit, if $m > 1$, within the parameters set forth for these moieties above, and Q is independently defined in each repeat unit, if $m > 1$, each Q being independently either -O- or - NR_3 -, and wherein X and Y are, independently in each case, hydrogen, a C_1 - C_7 linear, branched, or cyclic hydrocarbon, or a group having the formula $-\text{CR}_1\text{R}_1'-\text{CR}_2\text{R}_2'-\text{Z}-\text{F}$, with F being either -O- R_3 or - NR_3R_4 , where R_4 is defined similarly to R_1 , R_1' , R_2 , R_2' , and R_3 above, and with Z, R_1 , R_1' , R_2 , R_2' , and R_3 defined as above, or wherein X and Y are linked together form a nitrogen-containing heterocyclic C_4 - C_7 ring;

from about 1% to about 30% by weight of a hydroxylamine derivative having the formula

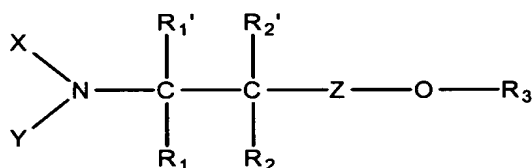


wherein R_1 , R_2 , and R_3 are independently a hydrogen atom, a hydroxyl group, a substituted C_1 - C_6 straight, branched, or cyclic hydrocarbon group, a substituted acyl group, a straight or branched alkoxy, amidyl, carboxyl, alkoxyalkyl, alkylamino, alkylsulfonyl, or sulfonic acid group, or a salt of such compounds, and wherein at least one of R_1 , R_2 , and R_3 is not a hydrogen atom;

from about 0.1% to about 15% by weight of a corrosion inhibitor having single or multiple functionalities of one or more of the following: hydroxyl group,

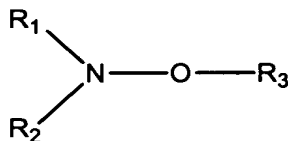
carboxylic acid, thiol group, amino group, alkoxy group, amidyl group, alkoxyalkyl group, alkylamino group, alkylsulfonyl group, sulfonic acid group, or a salt thereof; and less than about 30% by weight of water, wherein the composition is capable of removing residue from an aluminum or aluminum alloy substrate or a copper or copper alloy substrate layer, while maintaining an acceptably low etch rate with respect to the aluminum or aluminum alloy substrate or substrate layer.

39. A composition consisting essentially of: from about 20% to about 80% by weight of a two-carbon atom linkage alkanolamine compound having the formula



wherein R_1 , R_1' , R_2 , R_2' , and R_3 are, independently in each case, hydrogen or a linear, branched, or cyclic hydrocarbon containing from 1 to 7 carbon atoms, wherein Z is a group having the formula $(-\text{Q}-\text{CR}_1\text{R}_1'-\text{CR}_2\text{R}_2'-)_m$, such that m is a whole number from 0 to 3, R_1 , R_1' , R_2 , and R_2' are independently defined in each repeat unit, if $m > 1$, within the parameters set forth for these moieties above, and Q is independently defined in each repeat unit, if $m > 1$, each Q being independently either -O- or - NR_3 -, and wherein X and Y are, independently in each case, hydrogen, a C_1 - C_7 linear, branched, or cyclic hydrocarbon, or a group having the formula $-\text{CR}_1\text{R}_1'-\text{CR}_2\text{R}_2'-\text{Z}-\text{F}$, with F being either -O- R_3 or - NR_3R_4 , where R_4 is defined similarly to R_1 , R_1' , R_2 , R_2' , and R_3 above, and with Z, R_1 , R_1' , R_2 , R_2' , and R_3 defined as above, or wherein X and Y are linked together form a nitrogen-containing heterocyclic C_4 - C_7 ring;

from about 11% to about 18% by weight of a hydroxylamine derivative having the formula



wherein R_1 , R_2 , and R_3 are independently a hydrogen atom, a hydroxyl group, a substituted C_1 - C_6 straight, branched, or cyclic hydrocarbon group, a substituted acyl group, a straight or branched alkoxy, amidyl, carboxyl, alkoxyalkyl, alkylamino, alkylsulfonyl, or sulfonic acid

group, or a salt of such compounds, and wherein at least one of R_1 , R_2 , and R_3 is not a hydrogen atom;

from about 0.5% to about 7% by weight of a corrosion inhibitor having single or multiple functionalities of one or more of the following: hydroxyl group, carboxylic acid, thiol group, amino group, alkoxy group, amidyl group, alkoxyalkyl group, alkylamino group, alkylsulfonyl group, sulfonic acid group, or a salt thereof; and

less than 35% by weight of water,

wherein the composition is capable of removing residue from an aluminum or aluminum alloy substrate or a copper or copper alloy substrate layer, while maintaining an acceptably low etch rate with respect to the aluminum or aluminum alloy substrate or substrate layer.